



DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
WATER QUALITY MONITORING AND ASSESSMENT SECTION  
WATERSHED INFORMATION SHEET

## Lake Taneycomo Basin-11010003

### Basin Description

The basin contains Lake Taneycomo, an impounded section of the White River between Table Rock and Powersite dams and all direct tributaries. The largest tributaries are Bull, Roark and Turkey creeks.

The basin is 1,506 square miles in area. Sixty percent of this area is forest, 37 percent is pasture and hayfields and two percent is water. The rapidly urbanizing Branson and West Branson areas lie within this basin. About 80 percent of the public drinking water supply for Branson is withdrawn from Lake Taneycomo, the remainder is from groundwater. Due to the relatively low height of Powersite dam, Lake Taneycomo has more the shape and character of a large, slow flowing river than a reservoir. The flow in Lake Taneycomo is controlled by releases from Table Rock dam and minimum flows are about 100 cfs.

Average annual rainfall is 43 inches. Stream flow statistics for the basin are shown in Table 1.

Table 1. Stream Flow Statistics for the Lake Taneycomo Basin

Stream/Location	Wtrshed. Area (sq.mi.)	Period Of Record	Flow (cfs)				
			90 <sup>th</sup> Percentile *	Mean	Median **	10 <sup>th</sup> Percentile ***	7Q10 Low Flow+
Bull Cr. nr. Walnut Shade	191	1994-2004	397	183	52	5.2	0.5
Lk. Taneycomo @ Branson		1909-10 1951-81		2,100		150	

\*Flow is less than this amount 90 percent of the time

\*\*Flow is less than this amount 50 percent of the time

\*\*\*Flow is less than this amount 10 percent of the time

+ The lowest average seven consecutive day flow that occurs with a recurrence interval of 10 years.

Except for the ridgetops in the upper parts of the stream drainages, which are in Mississippian limestone, the surface of the basin lies with the Jefferson City – Cotter dolomite. The Burlington limestone from which so many spring systems are developed to the north in the James River basin, thins rapidly toward Lake Taneycomo. Thus there are only two small springs of note, both emerging from Mississippian limestone. However, based on low flow measurements made in the adjacent and geologically similar

Swan Creek drainage, base flows are believed to be well sustained during dry weather in Bull Creek, the only sizeable stream in the basin.

## **Water Quality Concerns**

Acceptable water quality is defined by Missouri's Water Quality Standards [<http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-7a.pdf>] . Streams or lakes that do not meet these standards are considered "impaired." They may not be fit for certain uses such as swimming, drinking water supply or protection of fish and other aquatic life. Waters are considered to be "affected" rather than "impaired" if water quality changes are less serious and state standards are not exceeded. These standards also list more than 3,600 classified streams and more than 400 classified lakes in the state. A classified stream is one that is either a permanently flowing stream or one that may stop flowing in dry weather but still maintains large pools of water that support aquatic life. Unclassified streams are small tributaries to classified streams. They typically have flowing water only during wet weather and are dry for the remainder of the year.

## **Point Source Pollution**

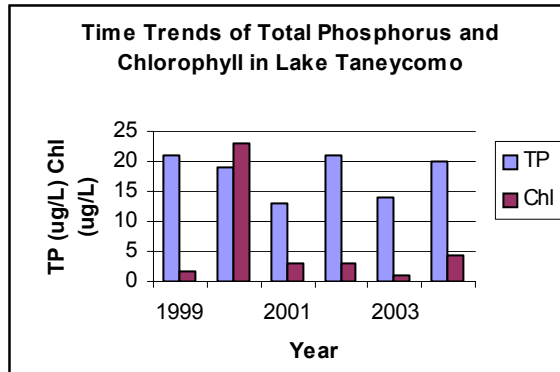
Point source pollution is a discharge of wastewater from a single location such as a wastewater treatment plant. Wastewater treatment plants can serve industries, small businesses, subdivisions, mobile home parks, apartment complexes, or entire cities. Wastewater from residential sources such as subdivisions, apartments and mobile home parks is often referred to as "domestic wastewater". It contains primarily treated human wastes, food wastes and detergents. The primary pollutants of concern in domestic wastewater are the amount of organic matter, which is commonly reported as Biological Oxygen Demand (BOD), suspended solids, and ammonia. Industrial and commercial wastewater can be more complex and may contain, in addition to domestic wastes, heavy metals or man-made organic chemicals that can be potentially toxic. Discharges from most municipal wastewater treatment plants are usually a mixture of domestic and industrial/commercial wastewater. Most wastewater plant discharges are also typically high in nitrogen and phosphorus, two elements that act as fertilizers and can cause excessive algae growth in waters receiving these discharges.

### **Wastewater Treatment**

<http://www.dnr.mo.gov/env/wpp/watersheds/info/wastewater-treatment.pdf>

There are 57 permitted domestic or industrial/commercial point sources that discharge a combined 7.17 million gallons per day (mgd) of treated wastewater into the waters of the the Lake Taneycomo basin. Most of this wastewater is discharged directly into or very near to Lake Taneycomo itself. There are 325 miles of classified streams in the basin, none of which are known to be affected or impaired by point source wastewater discharges. There are 0.6 miles of unclassified streams affected or impaired by point

source wastewater discharges. The largest discharges in the basin are the two Branson municipal wastewater treatment plant (wwtp) discharges with a combined flow of 4.5 mgd and the Hollister WWTP 1.2 mgd discharge.



Because of concerns about increasing algal growth in Lake Taneycomo, state regulations now put limits on the amount of phosphorus that can be discharged by most point source discharges in this basin. Over the past six years, mean total phosphorus in the lower portion of Lake Taneycomo has been about 0.018 mg/L. The total phosphorus level flowing into Lake Taneycomo from Table Rock Lake has been 0.009 mg/L, suggesting that point

source phosphorus discharges within the Lake Taneycomo basin are approximately doubling the amount of phosphorus in Taneycomo.

### Nonpoint Source Pollution

The basin is predominantly forested and has very little cultivated land. Sheet erosion is estimated at 2.5-5 tons/acre/year and gully erosion at 0-0.16 tons/acre/year. Thus, there are no basin-wide nonpoint source problems. However, bacterial contamination of shallow groundwater appears to be a common problem in the basin. A 1982 study sampled 75 springs and streams in Taney County and found 80 percent of springs and 58 percent of stream sites sampled contained optical brighteners, chemicals found in laundry detergents and therefore evidence of domestic sewage. The problem was most severe in developed areas where 95 percent of springs and 75 percent of streams sites sampled indicated the presence of optical brighteners.

Sedimentation of Lake Taneycomo has been substantial. From its creation in 1913 until completion of Table Rock dam in 1958, 42 percent of Lake Taneycomo filled with sediment. A second sedimentation study indicated an additional 7 percent of the lake had filled with sediment between 1958 and 1987.

### Water Quality Management

The department achieves water quality management of point source pollutants through the issuance and enforcement of wastewater discharge permits. These permits limit the amount of pollutants that can be discharged. All point source wastewater dischargers must obtain a permit and adhere to its discharge limitations. All permits require at least a level of treatment equal to national wastewater treatment standards. In situations where these national treatment standards are not adequate to protect the streams or lakes receiving these wastewater discharges, stricter permit limits that do protect these

waters are required. The permits require regular monitoring and reporting of discharge quality. The department also conducts regular inspection of wastewater treatment facilities and receiving waters.

Nonpoint source pollution is addressed through the state's nonpoint source management plan. This plan is a cooperative program between the Department of Natural Resources and other federal, state and local government agencies or organizations, local landowners and other interested citizens. The plan emphasizes addressing problems at the watershed level through the use of management practices that control nonpoint pollution. The most commonly supported practices are those that control soil erosion on agricultural and urban lands, improve quality and quantity of forage on grazing lands, protect riparian zones, and those that control runoff of animal manures, fertilizers and pesticides.

The Missouri Department of Natural Resources monitors water chemistry and aquatic invertebrate communities at many locations in Missouri. The department also tracks the quality of domestic, industrial and storm water discharges. These monitoring activities provide information on water quality problems, such as their specific location, pollutants, sources and possible solutions. This information guides the management activities the department takes to protect water quality in Missouri.

### **Web links**

US Geological Survey <http://mo.water.usgs.gov/>

Lakes of Missouri Volunteer Monitoring <http://lmvp.org/lakes.htm>